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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,495	01/22/2004	Malcolm G. Pettigrew	2003B004/2	5222

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EXAMINER

BOYER, RANDY

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/762,495	PETTIGREW ET AL.	
	Examiner	Art Unit	
	Randy Boyer	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-75 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>22 January 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 26 and 27 are rejected under 35 U.S.C. 102 (a) as being anticipated by Miller (US 6403854).

3. With respect to claim 26, Miller discloses a process for removing methanol from an oxygenate to olefin reactor, the reactor effluent stream comprising methanol, olefin product and water, and comprising the steps of (a) quenching the reactor effluent stream with a first quench medium to remove water to produce a first effluent stream (column 10, lines 14-33), and (b) quenching the first effluent stream with a second quench medium, wherein a majority of methanol in the second effluent stream is removed (column 11, lines 13-19).

4. With respect to claim 27, Miller discloses cooling the reactor effluent stream and quenching the reactor effluent stream to remove water (column 10, lines 14-33).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-25 and 28-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller (US 6403854) in view of Oleszko (US 3674890).

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9. With respect to claim 1, Miller discloses a process for quenching a reactor effluent stream from an oxygenate to olefins reactor comprising the steps of (a) quenching the reactor effluent stream in a first quench stage with a first quench medium comprising an aqueous solution to form a first liquid fraction and first effluent stream (see Miller, column 10, lines 20-33); and (b) quenching the first effluent stream in a second quench stage with the first quench medium producing a second liquid fraction and a second effluent stream (see Miller, column 11, lines 13-19).

Miller does not disclose quenching the second effluent stream in a third quench stage with a second quench medium comprising a substantially oxygenate free quench medium.

However, Oleszko discloses a process for the quenching of a cracked gas hydrocarbon stream through multiple quench zones in a single quench tower (see Oleszko, column 1, lines 10-24, and Figure 2). Oleszko explains that the process is effective in removing substantially all of the water that is formed as a byproduct in the upstream cracking operation as well as removing particulate carbon present in the cracked gas stream (see Oleszko, column 5, lines 16-20). Furthermore, Oleszko points out that the process is compatible for integration with other processes for the production of alkenes (olefins) and that it is advantageous because it requires little equipment (see Oleszko, column 1, lines 54-57).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Miller so as to increase the

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number of quench stages thereby increasing the removal of water and recovery of catalyst fines from the effluent stream of the oxygenate to olefin reactor.

10. With respect to claim 2, Miller discloses a first liquid fraction having no more than 20 wt% water and a majority of catalyst fines (see Miller, column 9, lines 4-10 and column 10, lines 29-33).

11. With respect to claims 3-5, Miller discloses the removal of water and oxygenates (e.g. methanol) in a downstream quench stage (see Miller, columns 10 and 11).

12. With respect to claim 6, Miller discloses cooling the second liquid fraction to form the first quench medium (see Miller, column 11, lines 25-30).

13. With respect to claim 7-8, Miller discloses a quench stage comprising a quench fitting, a first settling vessel (see Miller, column 10, lines 29-46), and a second settling vessel (see Miller, column 11, lines 13-30).

14. With respect to claim 9, it is known in the art to provide for recycle of a portion of a product stream to the reactor, e.g. in order to aid in product conversion and to help maintain a steady reaction temperature (see e.g., Perry's Chemical Engineers' Handbook, 7th ed., page 7-20).

15. With respect to claim 10, tubular quench fittings having a plurality of spray nozzles are known in the art. See e.g., Ngan (US 6626424).

16. With respect to claims 11-13, Oleszko discloses a second quench medium temperature that is 15°C lower than a first quench medium temperature (see Oleszko, column 5, lines 59-60 and 74-75).

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17. With respect to claim 14, Miller discloses withdrawing a portion of the second liquid fraction from the first condensate outlet and directing it to the first quench inlet and second quench inlet (see Miller, Figures 2 and 3).

18. With respect to claim 15, Oleszko discloses withdrawing a third liquid fraction from the second condensate outlet and combining it with the clarified aqueous stream (see Oleszko, column 2, lines 20-23 and Figure 2).

19. With respect to claims 16-25, Miller discloses the recovery of a substantially oxygenate-free quench medium (see Miller, column 11, lines 19-30).

20. With respect to claim 28-31, Oleszko discloses wherein the temperature of the first quench medium entering the second phase is 15°C lower than a first quench medium temperature (see Oleszko, column 5, lines 59-60 and 74-75).

21. With respect to claim 32, Miller discloses a first liquid fraction comprising water and catalyst fines (see Miller, column 10, lines 42-46).

22. With respect to claim 33, Miller discloses a clarified liquid stream comprising methanol and directing the stream to a methanol fractionator to remove the methanol (see Miller, column 2, lines 63-64, and column 10, lines 35-36).

23. With respect to claim 34, Miller discloses a concentrated fines stream (see Miller, column 10, lines 42-46).

24. With respect to claims 35-37, Oleszko discloses a process carried out at a pressure below 69 kPag (see Oleszko, column 2, lines 66-70).

25. With respect to claim 38, the prior art discloses a process for quenching an effluent stream comprising water, olefin product, and methanol, the effluent stream

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being entrained with catalyst fines, the process comprising the steps of (a) removing water (see Miller, column 10, lines 29-33), (b) separating catalyst fines (see Miller, column 10, lines 42-46), and (c) removing methanol (see Miller, column 2, lines 63-64, and column 14, lines 21-23), wherein steps (a)-(c) are performed in a single quench tower apparatus (see Oleszko, Figure 2).

26. With respect to claims 39-41, Oleszko discloses a process carried out at a pressure below 69 kPag (see Oleszko, column 2, lines 66-70).

27. With respect to claims 42-44, Miller discloses the removal of oxygenates (e.g. methanol) and recovery of an oxygenate free stream (see Miller, column 14, lines 21-23).

28. With respect to claim 45, the prior art discloses a process for quenching a reactor effluent stream comprising water, olefin product, and methanol, the reactor effluent stream being entrained with catalyst fines, the process comprising the steps of (a) removing water from the reactor effluent (see Miller, column 10, lines 29-33), (b) separating catalyst fines from the reactor effluent (see Miller, column 10, lines 42-46), and (c) removing methanol in the reactor effluent wherein the steps (a)-(c) occur at a pressure below 276 kPag (see Oleszko, column 2, lines 66-70).

29. With respect to claims 46 and 47, Oleszko discloses a process carried out at a pressure below 69 kPag (see Oleszko, column 2, lines 66-70).

30. With respect to claims 48-50, Miller discloses the removal of oxygenates (e.g. methanol) and recovery of an oxygenate free stream (see Miller, column 14, lines 21-23).

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31. With respect to claim 51, see discussion at paragraph 9 *supra*.
32. With respect to claim 52, quenching of a process stream in a horizontal quench fitting is known in the art. See e.g., Ngan (US 6626424).
33. With respect to claim 53, Miller discloses cooling a portion of the second liquid stream to form the first quench medium (see Miller, column 12, lines 26-28, and Figure 3).
34. With respect to claim 54, Miller discloses separating catalyst fines from the first liquid stream (see Miller, column 10, lines 42-46).
35. With respect to claims 55-57, Miller discloses the recovery of a purified water stream containing from which methanol has been removed to form a second quench medium (see Miller, column 11, lines 13-19).
36. With respect to claim 58, Oleszko discloses the process done in a single multi-staged quench tower (see Oleszko, Figure 2).
37. With respect to claim 59, Oleszko discloses a second quench medium temperature that is 15°C lower than a first quench medium temperature (see Oleszko, column 5, lines 59-60 and 74-75).
38. With respect to claim 60, Oleszko discloses carrying out the process at a pressure below 276 kPag (see Oleszko, column 2, lines 66-70).
39. With respect to claims 61 and 62, Miller discloses the first liquid stream comprising a concentration of catalyst fines (see Miller, column 10, lines 42-46).
40. With respect to claims 63, Miller discloses a first liquid fraction comprising between 5-10 wt % water (see Miller, column 10, lines 42-46).

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41. With respect to claims 64 and 65, Miller discloses a second effluent stream comprising light olefins (and little to no water) (see Miller, column 11, lines 16-19).

42. With respect to claim 66, Miller discloses a second effluent stream comprising light olefins (and little to no methanol) (see Miller, column 11, lines 16-22).

43. With respect to claim 67 and 68, Miller discloses a reaction temperature of between about 200°C and 600°C (see Miller, claim 5).

44. With respect to claims 69-74, Oleszko discloses a preferred temperature of effluent passing from the first stage of the quenching zone to the final stage of the quenching zone in the range of 15°C to 500°C (see Oleszko, column 3, lines 1-6).

45. With respect to claim 75, see discussion at paragraph 9 *supra*.

Conclusion

46. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

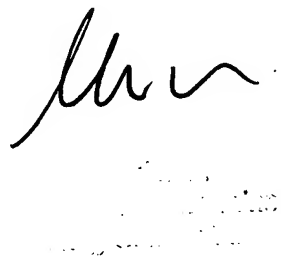
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RPB

A handwritten signature in black ink, appearing to be "M. W. Smith", is located in the lower right quadrant of the page. Below the signature, there is a faint, illegible stamp or text.